

THE
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THE BIOLOGIST

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PHI SIGMA SOCIETY

AN ORGANIZATION DEVOTED TO THE PROMOTION OF
INTEREST IN RESEARCH IN THE BIOLOGICAL SCIENCES
founded OHIO STATE UNIVERSITY, March 17, 1915.

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THE BIOLOGIST

VOLUME X

APRIL, 1929

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The National Convention

The National Convention of 1928 met in New York City, Dec. 26 and 27 at Teachers College, Columbia University. There follows a brief report of the meetings:

MEETING OF WEDNESDAY, DECEMBER 26

Morning Session:

The following delegates representing the chapters indicated were present:

Beta (University of Michigan)	C. Francis Byers
Delta (University of Maine)	W. Grofton Neally
Epsilon (University of Denver)	Warren R. Barnum
Zeta (University of Wisconsin)	Bernhard Domogalla
Eta (University of Akron)	Gerald T. Swartz
Theta (Michigan State)	E. F. Woodrock
Iota (Washington University)	Catharine M. Lieneman
Kappa (University of Kansas)	George T. McNair
Lambda (University of Montana)	June Kimball
Mu (University of California)	Lillian Hollingshead
Nu (Washington and Jefferson)	Connell H. Miller
Xi (University of Nebraska)	Joseph Reeves
Pi (Emory University)	B. A. Belcher
Rho (University of Illinois)	F. M. Clark
Sigma (University of Florida)	Edward T. Boardman
Upsilon (Miami University)	John C. Lotze
Phi (University of New Hampshire)	Theodore L. Karabelas
Chi (Montana State)	Frida Hendrickson
Psi (University of Washington)	Belle A. Stevens
Omega (University of Oklahoma)	Aaron J. Sharp
Alpha Alpha (University of Southern California)	Lena Higgins
Alpha Beta (Mount Union College)	Warren E. Wheeler
Alpha Gamma (University of South Dakota)	Howard C. Abbott

Following the formal opening of the Convention, the report of the retiring secretary, Doctor C. I. Reed, was read and accepted. In substance this report follows:

To the Members of the Council and Convention Assembled:

Greetings and best wishes for a successful and harmonious culmination of the efforts of the Convention.

It is with keen regret that I now relinquish official relations with Phi Sigma Society after nearly fourteen years of practically continuously active

participation in her affairs. Such a period of activity, I feel, entitles me to a final statement to you relative to some features of progress and to some future problems.

First let me stress an axiomatic fact, i. e., that Phi Sigma is now definitely established as a research organization in which members *must work*. Unfortunately, it has retained certain features that seem to a casual observer to place it in the large and ever growing class of so-called college honorary societies that serve no useful purpose beyond satisfying the gang spirit of *Homo sapiens*. I refer to the Greek letter designation of chapters, to the so-called secret ritual, which is entirely inadequate even for ritualistic purposes, to the ornate certificate that violates every rule governing such creations, and finally to the key, which serves no purpose but to satisfy the desire of the college student for emblematic adornment . . .

If this really is a society for the promotion of scientific research, if we are to be honest and consistent in our claims of such a function, then we must adopt a program of truly national proportions. Most of our important activities are local in nature so that the organization in reality consists of a federation of local societies. I recognize the desirability of retaining the freedom engendered by that relationship but at the same time a program should be adopted that will represent a function of the society as a whole.

This does not mean that the same local standards must be maintained in every chapter. This point has been a matter of some concern at times. After watching our system at work for seven years, I now feel that this question should no longer agitate anyone. The chapters in the larger institutions, capable of holding to a higher standard of accomplishment are serving their local situations most admirably in every case. Those in the smaller schools are obliged to practice slightly modified policies but still they are filling local needs . . .

There are several rather remarkable features of Phi Sigma activities. In various capacities I have had an opportunity to observe student activities and student organizations for nearly twenty years. Of all such organizations, Phi Sigma stands for certain things that are unique. Most similar societies are distinctly of the static type. Phi Sigma is distinctly the most highly developed in the direction of *dynamic* activity of all societies in which students actively participate.

The need for such an organization was already apparent before the parent chapter was organized in that numerous local groups had already been organized for purposes similar to our own. Some of these later became chapters while others are still functioning independently. . . .

As secretary, I have endeavored to maintain not only official relations but have also promoted an unofficial connection with both students and faculty members not members of Phi Sigma, in nearly all institutions in which we

have chapters. Lest this be misunderstood, I have not undertaken this activity as a species of espionage but because I have been profoundly interested and proud of the organization and desirous of seeing things in the light of an observer. By these two types of activities I have gained a perspective of the whole society enjoyed by no one else. One striking feature derived from this subrosa relationship is expressed in the words of one observer, "Phi Sigma has become known as the one student organization in which everyone has to work to some definite end. If they fail to do so, they may not lose membership or official status but they will eventually and inevitably lose standing among their fellows."

I sometimes feel that the one word, "WORK", should be our motto. Hard, consistent work toward a definite end has more often accomplished worth while results in scientific research than personal ability, scientific preparation, official position, extensive equipment or any other appanage of scientific effort. I hope the chapters will accept it as their function to promote that spirit of work.

Let us dispense, then, still further, with useless superficial paraphernalia so often characteristic of student organizations. Take due pleasure in the recognition of past accomplishment accorded by election to membership but do not lose sight of the fact that the greater obligation lies ahead.

Let me beseech you then, when assembled in Convention now and in the future and in chapter activities to keep in mind the great fundamentals and let all trivial details and non-essentials occupy a minimum place in your deliberations.

To my mind the individual freedom of the chapters in dealing with local situations has been the greatest single factor in the successful development of the society. Preservation of the integrity of the chapters is essential to further progress. While centralization of authority in the Council is essential in certain relationships it should always be conceded by the Council that its authority is to be exercised only in case of situations likely to result in actual injury to the individual chapters or the whole society. As a corollary the chapters must swim or sink by their own efforts or failure thereof, and chapter officers *must* accept responsibility for results. . . .

There have been repeated efforts on the part of various chapters to reduce financial obligations. In that connection, I wish to say that in my experience, no other organization has carried on such extensive activities with as little expenditure as has this one. While I have not asked or expected remuneration for my services as Secretary, I must admit that there have been times when the burden was discouragingly heavy and the time necessary for carrying on my own work has often been encroached upon seriously by the minimum essential duties as Secretary. I do not believe you have a right to ask anyone to serve in that capacity without financial remuneration of some kind, now

that the duties of the office have grown to such proportions as present activities necessitate.

In my estimation the most serious weakness in our organization at present is the failure to retain and maintain the interest of the alumni. There is, of course, a considerable group that we will lose because of a shift in professional interest, but there should be serious consideration of some means of keeping alive the active interest of those who continue in biological fields.

One of our critics recently held that the society needs officers of prestige and standing in the educational field. Leaving out of consideration individual cases, I maintain that active interest and hard work on the part of officers who have been active members and who are young enough to still be able to generate some ideas and enthusiasm, plus coöperation and loyal support from the chapters will accomplish more than any amount of prestige and eminence accruing to individuals.

In conclusion, I see a future for Phi Sigma that will make it the most important educational scientific society in this country, *provided* every individual member accepts his personal responsibility and the society as a whole works as a unit uncomplicated by selfish motives and with eyes always on the future, anticipating the trend of progress and development.

I want to thank the Council and chapters for the uniformly loyal support and coöperation I have received in my poor efforts which were too often inadequate to the task at hand.

C. I. REED.

The following matters were then discussed:

- a. The question of reorganization of Council activities incidental to the resignation of Doctors Davis and Reed. The Council appointment of Dr. A. I. Ortenburger as Secretary-Editor was approved. A resolution of thanks to Doctor and Mrs. Davis for their services was adopted.
- b. The question of keys.
- c. The program of chapter activity as exemplified by the University of Wisconsin.
- d. The status of Phi Sigma as an honorary society, so-called.
- e. Organization of alumni.
- f. The policy of the BIOLOGIST.
- g. The policy of expansion with particular reference to small schools.

These various matters were referred to proper committees as follows:

- (1) Organization.
- (2) Amendments.
- (3) Biologist.
- (4) Coöperation.
- (5) Resolution.

The reports of these committees will be found below (pp. 9-13).

The petitions of Lawrence College and the University of Pittsburgh were then presented and acted upon favorably.

Motion to adjourn.

Afternoon Session:

WEDNESDAY, DECEMBER 26

1. Motion carried that election of officers be first business.
2. Dr. Paul B. Sears elected President.
3. Mr. Erwine Hall Stewart elected Treasurer.
4. Note.—Doctor Ortenburger's appointment by Council already approved.
5. Committee reports as follows:

REPORT OF COMMITTEE ON ORGANIZATION

Representatives

Univ. of Michigan, C. F. Byers (<i>Beta</i>)	University of California, Lillian Hollingshead (<i>Mu</i>)
Montana State, Frida Hendrickson (<i>Chi</i>)	
Washington Univ., Catharine M. Lieneman (<i>Iota</i>)	University of New Hampshire, T. L. Karabelas (<i>Phi</i>)

The following recommendations were made:

1. That the positions of National Secretary and Editor be combined.
 2. That the office of Assistant Secretary be eliminated.
 3. That a sum of money, approximately \$300.00 per year be given to the Secretary-Editor for the work of his office.
 4. That a permanent depository for Phi Sigma records be founded; that this might be handled by the National Council with the following recommendations: That if possible such a central depository be located where there is a chapter of Phi Sigma and that some faculty member serve as custodian of the records.
 5. That there is no objection to having two men from the same institution serve on the National Council at the same time.
 6. That it is more important to have members on the National Council who will work for Phi Sigma than members whose names are possibly more impressive.
 7. That the matter of honorary membership be left to the individual chapters as long as the Constitution is followed.
 8. In regard to the large and small chapters: That any chapter petitioning should be judged solely on the caliber of the biological work being done at the particular institution, and that the matter of size be considered unimportant.
- Representative McNair (*Kappa*) moved that the above report of the Committee on Organization be accepted. Passed.

REPORT OF COMMITTEE ON AMENDMENTS

*Representatives*Univ. of Maine, W. G. Neally (*Delta*)Univ. of Nebraska, Joseph Reeves (*Xt*)Univ. of Montana, J. Kimball (*Lambda*)

Univ. of Wisconsin, Bernhard Domogalla

Univ. of Denver, W. R. Barnum (*Epsilon*)(*Zeta*)

1. That Section 1 (a) of the By-Laws be amended to read in effect that the purchase of the key shall remain optional but that in case an initiate does not purchase a key, then he must give one dollar to the endowment fund. Passed.

2. That to Article III, Section 6, be added a part (b), to the effect as follows: Every petitioning group must be active for at least one year before it be granted a charter as a chapter of Phi Sigma. Passed.

3. That honorary membership remain a matter to be passed upon by the National Council. That the National Council shall limit the number of honorary members and that the Council shall have absolute power in approving the members nominated by the chapters; that Article IV, Section 5, should then read as follows:

"Any scientific worker who has achieved eminence in some branch of biological science shall be eligible to honorary membership, and as an honorary member shall be exempt from all dues and assessments and shall have all rights of active members, except those of voting and holding chapter office.

"The National Council shall limit the number of honorary members and the Council shall have absolute power in approving such members nominated by the chapters."

This recommendation was followed by much discussion and was finally passed. *Beta* Chapter voted negatively on this recommendation because of the chapter's disapproval of the necessity for Council ratification.

4. The question of people very much worthy of membership but not actually in school was brought up. Professor McNair moved that the phrase in Article IV, Section 2, of the Constitution, reading "students enrolled in a College or University" be deleted and replaced by the phrase "competent biologist"; also to add a paragraph after the word "membership" and before the second sentence in Article IV, Section 2:

"Any person who is a competent biologist and who is engaged in biological activity in or near a chapter of Phi Sigma may be elevated to active membership within the discretion of the chapter."

The matter of the "pink printed form" came up—particularly in relation to the starred subjects such as "soils" and "paleontology"; it was moved by the *Beta* representative that the pink sheet be used but that the professors' OK be not required; that this matter be left up to the Chapter Secretary and members be elected as per revised Article IV, Section 2, Constitution.

Considerable discussion; opposed by *Beta*; passed.

REPORT OF COMMITTEE ON THE BIOLOGIST

*Representatives*Univ. of Akron, G. T. Swartz (*Eta*),Univ. of South Dakota, H. C. Abbott
(*Alpha Gamma*)University of Kansas, G. T. McNair
(*Kappa*)Univ. of Southern California, Lena Higgins (*Alpha Alpha*)Emory University, B. A. Belcher (*Pi*)

The following recommendations were made:

1. As soon as convenient, another Directory like the one of 1923 shall be published.

2. Alumni members be appealed to for subscriptions to the BIOLOGIST.

3. That any illustrations for any articles appearing in the BIOLOGIST must have cuts furnished by the chapter or the individual writing the article.

4. That if reprints or additional copies of any number of the BIOLOGIST are wanted, that the Editor must know this at the time the article is sent to him; and moreover that the chapter or the individual must pay for these extra copies.

5. That the BIOLOGIST be issued beginning as soon as possible as a definite, quarterly publication: three of the numbers to appear during the school year and one of them to be issued during the summer. The summer number, for obvious reasons, is not to contain chapter reports or other similar material, but rather such things as descriptions of biological stations, museums, and other subjects of general biological interest.

6. That the size of the BIOLOGIST as a Quarterly, be held to about thirty-two pages per number if possible.

7. That the BIOLOGIST be printed upon white paper with the cover of the same color.

8. That effort be made to obtain advertising for the BIOLOGIST and that simultaneous letters from as many chapters as possible be written to possible advertisers such as publishers, microscope houses, etc.

9. That any additional money that is available to the BIOLOGIST go toward publishing more pages of interesting material and should not be used for expensive covers and the like.

10. That the single column page be continued as in Volume X, Number 2.

11. That new chapters should acquire complete files of the BIOLOGIST for the school library.

12. That full page photographs of national officers be published preferably shortly after their election and, ordinarily, just once, regardless of their reelection.

13. That THE BIOLOGIST continue regularly the following material if available or necessary:

- a. Any necessary articles or announcements of national officers.
- b. Chapter reports and chapter alumni news, etc.
- c. Longer reports concerned with individual chapters such as those describing *Beta* and *Zeta*.
- d. Convention reports.
- e. Descriptions of biological stations.
- f. Descriptions of museums of natural history or special field work of members.
- g. Interesting accounts of biological research or of biologists of importance.
- h. Functions of the many biological journals.

This report was accepted.

REPORT OF THE COMMITTEE ON CO-OPERATION

Representatives

Michigan State, E. F. Woodcock (*Theta*), Univ. of Illinois, F. M. Clark (*Rho*)

Miami Univ., J. C. Lotze (*Upsilon*) Univ. of Oklahoma, A. J. Sharp (*Omega*)

1. Each chapter advised to publish booklet of chapter members past and present.

2. Each chapter have an annual home-coming event in the spring for its present members and alumni.

3. Interchapter activities advised, such as one chapter putting on a program for a meeting of a neighboring chapter. Matter of payment of expenses involved left undecided.

4. Research fund of some sort should be established. (a) Note: Such a fund already exists theoretically but practically no money available. Question: Should money not spent for keys be so used?

Moved that report of Committee on Coöperation be accepted. Passed.

It was the judgment of the Convention that the National Council go ahead and adopt the scholarship idea; that what money is available be used for a scholarship to some biological station, even though the amount at first be small; that the individual winning the scholarship be allowed to pick any reputable biological station for his work.

REPORT OF COMMITTEE ON RESOLUTIONS

Representatives

Washington and Jefferson College,

C. H. Miller (*Nu*)Univ. of Florida, E. T. Boardman (*Sigma*)Univ. of Washington, B. A. Stevens (*Psi*)

Mount Union College, W. E. Wheeler

(*Alpha Beta*)

Recommendations:

1. That the preamble of the Constitution be so altered that the Society be distinctly known as a working group, interested in research in the biological sciences; in effect that election to Phi Sigma be an opportunity for work rather than election to an honorary society. Motion made and passed.

2. That the Society give a purse of \$50.00 together with a jewelled key to Dr. C. I. Reed, former National Secretary. Passed.

3. Suggested that it be made clear that the membership of Phi Sigma be both undergraduate and graduate; this suggestion was rejected.

REPORT OF RITUAL COMMITTEE

Dr. Keefe gave the report of the Ritual Committee. There was some discussion but no action.

Dr. Keefe also demonstrated by means of a large colored plate a possible coat-of-arms for Phi Sigma which he had worked out. Discussion.

Meeting adjourned.

MEETING OF THURSDAY, DECEMBER 27

Morning Session:

The morning was spent in the reading of scientific papers by members of several chapters of Phi Sigma. Abstracts of these papers follow:

NATURAL REVEGETATION OF SYMPHORICARPOS IN
WESTERN MONTANA

C. C. Averill (Lambda Chapter), University of Montana
(*Abstract*)

The four species of *Symphoricarpos* occurring in Western Montana are *S. occidentalis*, *S. racemosus*, *S. rotundifolius*, and *S. oreophibius*.

The most abundant growth occurs in canyon bottoms and along creek banks. The upper limit of elevation is around 6000 feet.

The character of growth and abundance of these species makes them important shrubs in the control of erosion. The leaves of the plants are very palatable to sheep and cattle, thus making it an important browsing plant.

Symphoricarpos racemosus was the species used in the laboratory for vegetative and germination tests. Vegetative growth was also studied on three different sites (moist, dry, and intermediate).

The shrub reproduces itself both vegetatively and sexually. Germination tests and vegetative reproduction studies show that the plant is dependent upon the latter method for its dominance on any area. The rate of vegetative reproduction is directly proportional to the moisture content of the soil.

There is a chance that stem and root cuttings could be used in artificial revegetation of eroded areas due to the rapid vegetative growth.

STUDIES ON MICROSPORE FORMATION IN ARROW ARUM
(*Peltandra virginica*)

Bascom A. Belcher (Pi Chapter), Emory University
(Abstract)

Microspores are formed in sporangia arranged in spiral rows on a fleshy axis, the spadix.

Reduction in chromosome number takes place during the months of May and June in the vicinity of Atlanta, Ga.

The divisions of all the spore mother cells in one sporangia take place simultaneously.

A true nucleolus is found in the resting cell. During prophase stages of first meiotic division the nucleoli are observed to become vacuolated and eventually disappear.

The achromatic figure shows up distinctly in the preparations. No evidence of a centrosphere is found. Instead, the spindle fibers toward each pole remain spread out considerably and fade into the peripheral cytoplasm.

The equatorial plate shows the chromosomes grouped in one plane. A polar view of this stage shows a disc of chromosomes arranged in somewhat of a circular plate.

An approximate count of chromosomes was made.

SOME NOTES OF INTEREST CONCERNING THE CRABS
OF ANAHEIM SLOUGH

Lena Higgins (Alpha Alpha Chapter), University of Southern California
(Abstract)

Anaheim Slough, the territory from which the material included in this survey was gathered, consists of an intricate system of sloughs. It extends inward from the main channel of San Pedro about five miles south of the city of Long Beach.

Different phases of study of the fauna of both Mission Bay, San Diego, and this slough have been carried on by a group of ten graduate students working under the direction of Dr. Irene McCulloch of the University of Southern California.

My work was with the crabs and restricted to the Brachyuran Decapods of which to date, twenty-four species have been found. Since so little is known concerning species on the Pacific coast, considerable time was spent on taxonomic studies. In this work one extralimital species, *Callinectes arcuatus* Ordway, was found. This species has not been reported, previously, north of Cape San Lucas.

Five commensal crabs were discovered: *Fabia subquadrata* Dana in the mantle cavity of the mussel *Mytilus californicus*, *Pinnixa littoralis* Holmes in *Schizothaerus nuttallii*, *Pinnixa occidentalis* Rathbun, *Scleroplax granulata* Rathbun, and *Opisthopus transversus* Rathbun in *Zirphaea gabbi*, and *Bullaria gouldiana*.

For regeneration, feeding, and laboratory experiments *Pachygrapsus crassipes* Randall was found to be the most satisfactory species.

The fiddler crab, *Uca crenulata* Lockington, was discovered in the heavy mud bank just at the highest tide line.

CELL CONSTANCY IN PLANTS

THE RESIN PASSAGES AND ENDODERMIS OF THE SCOTCH PINE

(*Pinus sylvestris*) L.

Norberto Magsumbol (Alpha Gamma), University of South Dakota

(Abstract).

A degree of cell constancy has been shown in the animal world, therefore it is fitting for botanists to determine whether there is a correlative cell constancy in the plant kingdom. Free-hand sections of needles and one year old stems of the Scotch pine were examined for resin passages and endodermis. The number of resin ducts in 125 pairs of leaves for 1925 shows that about one-half of the pairs have an equal number, and the average is 9.7; for 1926 needles, the average is 10.0; and for 1927, the average is 13.3. The average number of cells of the endodermis for 1925 leaves is 47.6; for 1926 leaves 47.3; and for 1927 leaves 60.8. These results were compared with the rainfall records. Thus, the average number of resin passages and the average number of cells of the endodermis is directly proportional to the precipitation during the growing months, providing other conditions are constant. We may expect a constant average number of resin ducts and cells of the endodermis under constant and controlled conditions.

THE DEER-MOUSE, PEROMYSCUS, A VALUABLE LABORATORY MAMMAL

George T. McNair (Kappa), University of Kansas

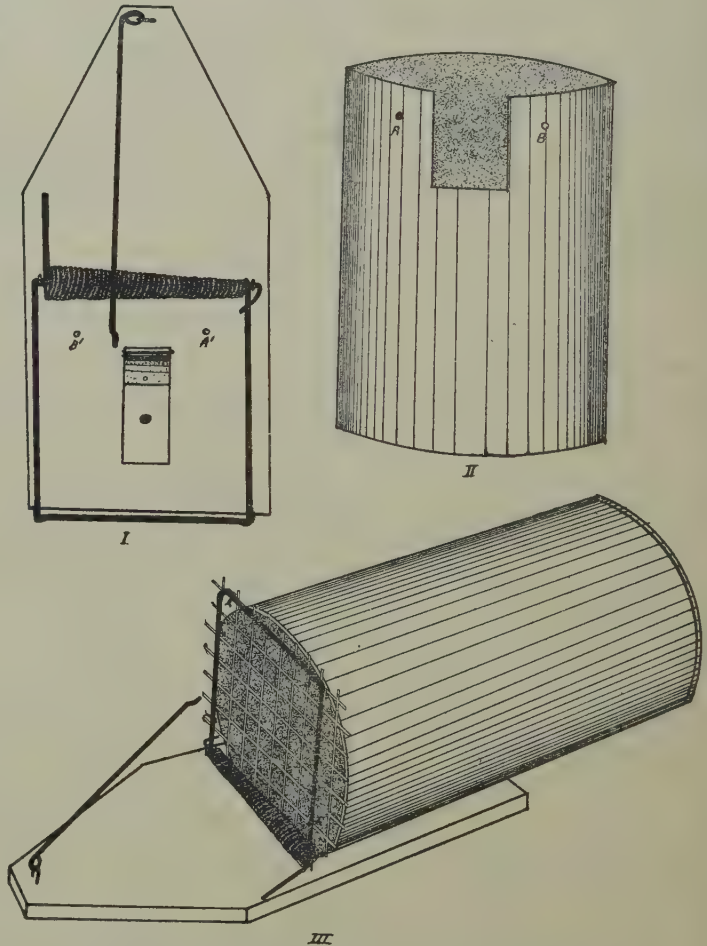
(Abstract)

It does not seem to be generally recognized that in the deer mice of the genus *Peromyscus* we have possibilities for excellent laboratory mammals.

greater possibilities probably than in any other wild mammals in this country.

Species of this genus are to be found in every section of the United States. They are also probably more numerous than any other mammal in the United States. They are easily caught, easily handled, cheaply housed and cheaply fed. They are exceptionally hardy and free from disease. They are prolific and start breeding at a little over two months of age. With proper treatment a large percentage will produce young almost every month in the year, and last but not least, subspecies and even different species will interbreed freely in captivity. They are not offensive to the olfactory sense or in any other way.

Peromyscus are easily caught in live-traps. At the University of Kansas we use a simple trap consisting of a tin can wired onto an ordinary mouse trap with a piece of hail screen fastened to the spring to close the mouth of the can. This trap is described fully by Burt in the *Journal of Mammalogy* for November, 1927.



An Effective Live Trap for Catching Small Mammals
(Cut loaned by the *Journal of Mammalogy*.)

After three years of experimenting with the care of *Peromyscus* the writer is able to get a slightly higher rate of reproduction from these mice in the laboratory than occurs in the native wild state.

The essentials for the care of these mice consist of three or four simple requirements.

1. A comparatively quiet room for the cages.
2. A relatively low temperature and subdued light in the room. After a check on two colonies (one of which was kept in a warm well lighted room in which guinea pigs and white rats were also being reared and the other in a cool room lighted only from the north) it was found that 58 per cent of the latter colony were reproducing, while in the former only 27 per cent were reproducing during the month of June which is just past the peak of the breeding season.
3. The third essential is a proper diet. A great variety of feeds have been tried but a mixture of oats, oat meal, freshly sliced carrots, and occasional bone scraps has been found to be one of the most effective and also most convenient. In nature their food consists of a great variety of weed and grain seeds and some animal matter.
4. Overfeeding must be guarded against. Feeding only every other day is sufficient. The drinking water is always changed at the same time.
5. Cleanliness is one of the important essentials for the successful handling of these little mammals.

POLYSPERMY IN THE ROTIFER, ASPLANCHNA AMPHORA

Joseph C. Reeves (Xi Chapter) University of Nebraska
(Abstract)

Fertilization in the egg of the rotifer is usually effected by the union of an egg and a sperm but sometimes in rare cases more than one sperm may enter the egg. One of these polyspermic eggs of the rotifer, *Asplanchna amphora*, has been found showing thirty-six sperm structures. Each sperm nucleus formed an aster which subsequently divided to form an amphiaster. Each one of these thirty-six sperms is represented by a mitotic spindle with an aster at each end and chromosomes arranged on the spindle fibers. The resulting spindles from these sperm do not remain separate but unite to form many kinds of multipolar spindles such as quadripolar and tripolar spindles. As many as five spindles may arise from one pole. In a certain section of the egg two tripolar karyokinetic figures connect each other by a single pole and from this one pole there arises five spindles. In this case the chromosomes are distributed to the three, four, or five poles, the resulting nuclei, therefore, receiving varying numbers or combinations of chromosomes. It is yet a question whether or not one, or more than one of these sperms unite with the egg nucleus and also what happens to the supernumary sperm after fertilization has been completed.

*STUDIES UPON THE EFFECT OF INTRA-CEREBRAL
INOCULATIONS ON LABORATORY ANIMALS*

Theodore Krutky and Gerald Swartz (Eta Chapter) University of Akron
(Abstract)

It has been stated by authors working on Poliomyelitis that the micro-organisms isolated from throats of patients were capable of producing flaccid paralysis in rabbits.

The objections held against the work of these authors remains in the possibility that perhaps other organisms, when injected intra-cerebrally, are capable of producing flaccid paralysis and respiratory paralysis resulting in death.

Results of the experiments by the above authors using *B. subtilis*, attenuated *Streptococcus* and *Staphylococcus* showed no resultant paralysis. However definite pathological symptoms were manifested in the case of *Staphylococcus*.

CALLIANASSIDAE OF THE WEST COAST OF NORTH AMERICA

Belle A. Stevens (Psi Chapter) University of Washington
(Abstract)

The *Callianassidae*, marine crayfish, are, with the exception of one deep water species, commonly found at about mean lowtide on gravelly and more or less muddy beaches. Their subterranean burrows extend to a depth of a few inches to several feet. A brief discussion is given, including notes on the color and the general distribution on the Pacific Coast for each species covered. Some general observations have been made on the life history. The *Callianassidae* on account of the material thrown up in the process of the excavation of their burrows, are a serious enemy of the oyster.

Afternoon Session:

The afternoon was devoted to a trip through The American Museum of Natural History under the guidance of Dr. A. I. Ortenburger, a former member of the staff.

February 12, 1929.

Professor C. I. Reed,
1615 South Ninth, Maywood, Illinois.
Dear Professor Reed:

It is our privilege as your former co-workers in the National Council of Phi Sigma to write you this letter at the request of the National Convention. It was the unanimous wish of the convention at its meeting in New York City, December last, that some substantial token of the gratitude of Phi Sigma be conferred upon you. You will find herewith a jeweled badge and a purse of fifty dollars, gifts from a grateful organization. No one knows better than those of us whose signatures appear below that Phi Sigma owes its very existence to your untiring and unselfish efforts. Regretting as we do the necessity which has compelled you to relinquish the burdens of an active member of the Council, may we venture to hope that your advice, based as it is on long experience, will continue to be available to us for many years.

Sincerely yours,

PAUL B. SEARS, *President.*

ANSELM M. KEEFE, *Vice-President.*

ERWINE HALL STEWART, *Treasurer.*

A. I. ORTENBURGER, *Secretary-Editor.*

To the Council and Society of Phi Sigma:

I want to express to you through the pages of the BIOLOGIST my very great appreciation of the tokens of recognition of my efforts as Secretary, which have recently come to me in the form of jeweled key and a check, the awarding of which, I understand the New York Convention unanimously authorized. My gratitude is tempered with a certain regret that my efforts were not more worthy and I feel very humble, indeed I look back and see so many things that I might have done, as well as many that might have been done better. The purse, I shall consider as a cash grant and will apply it in some worthy manner in the pursuit of my own modest researches. The key will ever be cherished as a possession without price.

The office which I occupied during the formative years of Phi Sigma's career was a difficult one and there were many trials and discouragements. I have not always dealt fairly, as I now view my activities in retrospect, but at the time, I was, I believe, always sincere in whatever I did.

In relinquishing my work, I feel that I have done so just when Phi Sigma is embarking on the most important and significant phase of development yet

undertaken. I therefore wish to urge upon every member that every possible effort be made to coöperate with the efforts of your Council and that every member give a full measure of service to what will, in time, I feel sure, become one of the greatest scientific research organizations in this country, not necessarily for its extent and numbers, but for the influence which it is destined to have on the lives of young scientists. So it is with keen regret that I take my place on the sidelines to watch the progress that will be made and know that I can no longer take an active part therein.

Again I extend thanks, poor as that may be, for the marks of appreciation extended. Respectfully submitted,

C. I. REED.

A WORD WITH THE CHAPTERS

Criticism is a sign of health and interest. The Council in its capacity as a group of servants of the society welcomes criticism no matter how sharply it strikes home. The chapters will find some interesting suggestions in one of the letters in the present number. This letter, that from Zeta Chapter, very properly raises the question as to whether the expenses attendant on National Conventions are justified or whether the funds had not better be spent in local chapter activity. So far as the Council may judge from the opinions expressed by delegates and by the chapters who have listened to their reports, the exchange of experience and ideas enjoyed in a National Convention does contribute a great deal that is valuable to the local chapter interest. Expressions of opinions on this and on other matters from the various chapters will be welcomed.

The Council takes this occasion to welcome formally the two new chapters which have been added to our number since the publication of the last *BIOLOGIST*. Namely, Alpha Delta, Lawrence College, Appleton, Wisconsin, March 7, and Alpha Epsilon, University of Pittsburgh, March 23.

The Council, not long ago, received a letter from one of the chapters which was having rather a discouraging experience because of local conditions. The Council feels that the chapters benefit in proportion as they assume responsibility for their own conduct and welfare. Occasions will arise when suggestions from outside the chapter ranks are helpful. It must not be forgotten that the assistance of the Council is ever ready in cases of this kind and chapters are urged to seek it when necessary.

PAUL B. SEARS, *National President*.

Chapter Reports

BETA

University of Michigan

Beta Chapter held its first semi-annual initiation banquet of this year on Feb. 14, 1929. For the first time in the history of this society at the University of Michigan, women were admitted to membership. The list of new members follows: Faculty: Mrs. Helen T. Gaige; Active: Mr. D. J. Ameel, Mr. G. O. Blough, Miss N. J. Bosma, Mr. R. M. Bradley, Mr. W. Clanton, Miss I. M. Clark, Mr. H. J. Deason, Miss E. Dressel, Miss G. V. Gorham, Miss H. Harpster, Mrs. M. H. Langlois, Miss Ruth Morris, Mr. H. C. Nicholson, Miss H. F. Price, Mr. P. L. Risley, Mr. W. E. Steidtmann, Miss O. G. Stull.

Beta Chapter has recently inaugurated a series of open meetings. The first of these was addressed by Dr. C. L. Hubbs on "Recent Advances In Biological Systematics".

E. P. CREASER.

EPSILON

University of Denver

Ancient Man?

On January 9, the members of Epsilon enjoyed a most entertaining illustrated lecture by Dr. Harold J. Cook of the Colorado Museum of Natural History, who is also a member of this chapter. Dr. Cook, though primarily a paleontologist, has in late years been concerned with a number of discoveries which show the great length of time man has been in America, much longer than any one had previously imagined. Dr. Cook showed slides of the fossil beds of northwestern Nebraska where fossilized bone implements were found, and a tooth which though at first was believed to be that of a man, is now considered to be that of a peccary. In Kansas in Pleistocene deposits a type of Asiatic Bison, now extinct, was found in an articulated position with a flint point under its shoulder blade. Similar finds have been made in Texas, in Oklahoma, and the latest at Folsom, New Mexico. The finds are associated with flora and fauna, besides the bison, of early and late Pleistocene. The flint points from Folsom are the best type of flint work to be found in America, and are as finely chipped by pressure as the Solutrean blades of Europe which were the maximum development of flaked stone work. In fact, one can easily believe, that the people who made these points to kill bison for food, must have been in quite an advanced state of culture. After the lecture Dr. Cook showed some examples of the fossilized bone implements and explained their probable use.

Dr. R. G. Gustavson, professor of biological chemistry, and one of our most honored members, is going to teach next year at the University of Chicago to take the place of a professor who will be on leave of absence.

The Department of Anthropology has lately been loaned a well preserved double deformed Peruvian skull. The skull belonged to one of the tribe of Aymara, who were conquered by the Incas. It has both frontal and occipital flattening causing two roundish bumps to appear at the back and making the forehead slope back abruptly from the eyes. Measurements and a thorough study will be made of the skull by Dr. E. B. Renaud, head of the department, and several Phi Sigma members, also from that department.

A seminar in zoology, conducted by Professor H. G. Owen, is composed almost entirely of Phi Sigma members. They are taking up a thorough study of the processes of evolution.

Martha Schroeder and Solomon Kauvar are studying the problem of parasites in cats.

Alice Parker and W. R. Barnum are making an investigation of the processes of reproduction in Protozoa.

In botany, George L. Terwilliger is doing collecting and classifying work on the Algae of Colorado, for his master's degree.

Leon Kelso is working on a problem in taxonomy, on the Rocky Mountain wild flowers.

KATHARINE BARTLETT.

ZETA CHAPTER

University of Wisconsin

Since the last issue of the BIOLOGIST, Zeta Chapter of Phi Sigma has elected and initiated into its membership sixteen graduate students from the various departments of the biological division of the University of Wisconsin. These men were elected because they had demonstrated their interest and ability in the field of biological science. At Wisconsin, Phi Sigma is recognized as an honorary society and only graduate students worthy of such an honor are considered for membership. Professor Emil Truog was elected an honorary faculty member and delivered the address at the initiation banquet held in December.

Semi-monthly meetings are held regularly. At the last chapter meeting D. P. Domogalla, Zeta's delegate to the National Phi Sigma Convention held in New York City during the holidays, made his report which was received with much concern by the large membership present, especially that regarding the general attitude of the National Convention of Phi Sigma. Following the report a very frank discussion ensued, concerning the ultimate purpose and usefulness of the national organization.

The former significance of Phi Sigma *honorary* biological society, as such, seems no longer to exist by virtue of the change of name to that of Phi Sigma research society, by vote of the national delegates.

The discussion at the local chapter meeting emphasized the point that the BIOLOGIST which originally was planned as a medium for intellectual thought, has in a large measure failed. Zeta Chapter feels that the BIOLOGIST should not be an organ for the presentation of scientific papers, as usually understood, or as an abstracting journal. Rather, while letting it continue as a news medium between the various chapters, could it not at the same time present articles from some of our well known leaders embodying inspiration and challenging thought?

It was felt that the expenses attaching to the bi-annual conventions were not in keeping with the benefits derived by local chapters. Would it not be possible to reverse the annual financial equation, whereby the national treasury now collects three dollars out of every four dollar annual membership dues? It is in the local chapter, after all, that the greatest amount of good can be derived by the greatest number of members. What could not the local chapter attempt (and achieve) with three dollars from each member instead of the lone one dollar which it is now permitted to retain? It could bring before its membership men of caliber and leadership in their respective fields of research. It could better promote fellowship among its own members and give them the opportunity to discuss their research problems and the bearing they may have upon other processes of life. Why bleed white the local chapters in order that a few may deliberate in a National Convention?

PETTUS HOLMES SENN.

ETA

Akron University

(Received Nov. 20, 1928)

Phi Sigma under the leadership of Theodore Krutky, our new President, is now starting another new year, as the oldest honorary society upon the campus of Akron University.

Eta chapter has maintained its prestige among the honoraries on the campus and the plans which have been formulated for the future have been so made as to keep Phi Sigma a worthy example for all other honorary societies.

The first meeting of the year was held October 16, in the Biology Laboratory and the various committees were appointed with Mr. Gerald Swartz acting as Secretary. Mr. Richard Wilcox was appointed historian and Mr. Frank Whiteman was named editor of the *Axis*, the biological paper which is sponsored by the Society.

Our faculty gave talks on the aims and problems of Phi Sigma. Their straightforward speeches were so stimulating that the students began to file their research problems for the ensuing year. Each member is also required to present a book review on some recent text in the biological field.

Previously it has been somewhat of a problem to get speakers for our meetings. However, this year the alumni members will speak. Because of the fact that they have been out in the world and are in the various biological fields their contributions should be of great interest and value.

Eta Chapter not only strives to maintain the standards of Phi Sigma, but also endeavors to create an atmosphere of coöperation in our Biology Department. With this idea in mind we planned a good will banquet, last June, which was a combination of the Phi Sigma and the Biology Club. Professor Fox presided as toastmaster and since it was Doctor Plowman's birthday, he and his wife were our honored guests. The banquet was such a huge success that it was decided that it should become an annual occasion.

With regret we state that Mr. Cassidy, our former President, is now attending Oberlin College. Mr. Keirn is attending the medical school at Western Reserve, while several other members are teaching. New members will be initiated in the near future. In closing this article, the members of Eta Chapter send their best wishes to the other chapters and we hope that they are progressing as rapidly and as well as we are. Eta chapter would appreciate all news from other chapters.

FRANK WHITEMAN.

THETA

Michigan State College

Since the last report from Theta Chapter, we have added eight new members to our ranks. These men are all graduate students, and most of them are working for their master's degree. Unless they show exceptionally promising material for Phi Sigma the men at our institution have to spend at least two-thirds of a college year at the institution before they may become eligible for membership. During this time they are interviewed concerning their work and are sized up as to Phi Sigma caliber.

The present active membership of this chapter is twenty-one members. The following departments of the college are now represented in Theta Chapter: animal pathology, bacteriology, botany, chemistry (agri. and biol.), dairy, entomology, farm crops, forestry, geology and zoology, horticulture, poultry, and soils.

Our delegate to the National Convention reported a very successful and interesting meeting as well as an enjoyable trip. He was glad for the contacts with other Phi Sigma delegates and the national officers as well. I am sure

the Chapter will benefit by the suggestions he is bringing back to us from the New York meeting.

Our social and business meetings continue to have the enthusiasm they have had all this school year. At our last meeting in December we had a banquet followed by the initiation of our eight new men. The meeting was closed by the presentation of an illustrated lecture by one of our older members, Mr. G. W. Bradt, instructor in zoology, on his experiences in British Guiana. It was a most interesting lecture.

At a coming meeting we will be favored with another illustrated talk by Dr. E. A. Bessey, head of the Botany Department, on experiences in Russian Turkestan. At each meeting some person of wide experience is present to give the society a broader knowledge and better views on life.

Among the lecturers appearing upon our programs was Dr. W. W. Lepeschkin of the University of Prague, (Czecho-Slovakia), whose address "The Colloidal State as a Necessity for Life" was open to the public. Dr. J. W. Crist of the Horticulture Department, M. S. C. spoke at the spring initiation meeting on "Vitamin C in Greenhouse Lettuce". At other meetings of the Chapter, the following were featured: Dr. W. L. Chandler of the Bacteriology Department with an address on "Colloidal Iodine, its Composition and Uses"; Mr. C. F. Huffman of the Dairy Department, speaking on "Heavy Concentrated Feeding and its Effect on Dairy Cattle"; and Dr. W. A. Kelley of the Geology Department with the topic "Pennsylvanian and Mississippian Faunas and Stratigraphy of Michigan". Recently the Chapter coöperated with the local branch of the Society of American Bacteriologists in sponsoring the appearance of Dr. Felix d'Herelle, now of Yale University, as a feature of a program dealing principally with the topic of bacteriophage.

Here is a bit of alumni news that will be of interest to the Phi Sigma members:

Dr. G. H. Coons (Theta '22) who has been associated with the Plant Pathology Department at Michigan State College for the past eighteen years has accepted the position as head of Sugar Beet Investigations with the Bureau of Plant Industry, U. S. D. A. The department feels the loss of so valuable a man.

Professor H. H. Wedgeworth (Theta '23) who has been located at the Mississippi A. and M. College for the past five years is now with the Botany Department at Michigan State College, where he is continuing with research work.

Dr. C. W. Bennett (Theta '27) has been transferred to the Experiment Station at Wooster, Ohio. He continues his research work on his major interest, small fruit diseases and the peach yellow disease.

Dr. E. V. Miller (Theta '25) has entered into the Bureau of Plant Industry, U. S. D. A., Washington, D. C. He is engaged in plant physiology work.

Dr. H. J. Lightbody (Theta '27) is the director of the chemical laboratory at the St. Margaret Memorial Hospital, Pittsburgh, Pennsylvania.

S. E. Wolff (Theta '27) is the botanist at the Texas A. and M. College Substation No. 5, Temple, Texas.

F. G. Larimer (Theta '27) is working on sugar beet disease investigations with the U. S. Dept. of Agriculture and Michigan State College cooperating at Rocky Ford, Colorado.

Harry A. Elcock (Theta '27) is in the Botany Department at the South Dakota State College, Brookings, S. D.

A. L. Houk (Theta '27) has been made instructor in the Chemistry Department, Michigan State College.

H. B. Cordner (Theta '27) is pursuing graduate work in the Horticulture Department at the University of Maryland, College Park, Md.

A. B. Strand (Theta '27) is in Knoxville, Tennessee, at the Agricultural College as a vegetable gardener and floriculturist.

M. S. Grunder (Theta '28) is connected with the Forage Crops Department at Western Washington State College, Puyallup, Washington.

Dr. E. P. Johnson (Theta '28) is now with the Michigan State Department of Health at the Biological Products Division, Lansing, Michigan.

Professor Frank Thorp, Jr. (Theta '28) has a position with the Animal Husbandry Department at the University of Illinois, Agricultural Experiment Station, Urbana, Illinois.

Professor L. M. Ware (Theta '28) who spent a year with the Horticulture Department here has returned to the Alabama Polytechnical Institute where he continues to do research work.

Professor J. G. Woodruff (Theta '28) on leave of absence to work a year at M. S. C., Horticulture Department, has returned to Georgia Experiment Station, Athens, Georgia.

ERNEST A. WALKER.

IOTA

Washington University

Iota Chapter, which is composed almost entirely of graduate students and faculty members, began the year with a total membership of fifty-three. These members are drawn from the Department of Botany at the Missouri Botanical Garden, from the Department of Zoology at Rebstock Hall on the Washington University campus, and from the Washington University School of Medicine. Since these departments are located in different parts of the city, our monthly meetings are held in rotation. In this way Phi Sigma serves a very valuable purpose in bringing together workers in related fields whose laboratories are quite widely separated. The speakers and the topics which they have presented to the chapter follow:

Dr. H. M. Miller, Jr.—Some Aspects of the Behavior of Larval Trematodes.

Dr. E. V. Cowdry—Cellular Changes Caused by Invisible and Filterable Viruses.

Dr. E. S. Reynolds—Disease Resistance in Plants.

At the first meeting of the year the holders of the Phi Sigma summer scholarships (which are seventy-five dollars each, to be used to help defray the expenses of the holder at any accredited summer laboratory) reported upon their work. Miss Elsie Mahaffy, a graduate student in zoology, who received one of the scholarships spent the summer at the Puget Sound Biological Station, Friday Harbor, Washington. Miss Catherine Lieneman, a graduate student in botany, who held the other scholarship, was unable to make use of it because of illness. Plans are now under way for the raising of the scholarship fund for next year.

At the annual banquet in December eight faculty members, twenty graduate, and one undergraduate active members were initiated. The list of initiates follows:

Dr. Jacques Bronfenbrenner, Dr. E. V. Cowdry, Dr. Miriam Lucas, Dr. James O'Leary, Dr. Gordon Scott, Dr. Amos Showalter, Dr. Frank Urban, Miss Caroline Allen, Mr. Lyle Beck, Mr. LeRoy Boling, Mr. Hamilton Card, Mr. Orville Clark, Mr. William Crawford, Mr. Calvin Drayer, Mr. Andrew Dowdy, Miss Pauline Darby, Mr. Karl Koenig, Miss Julia Lawrence, Miss Frances McConnell, Miss Betty Monaghan, Miss Marion Morris, Mr. Carroll Neff, Miss Mary Newman, Mr. Robert Phillips, Mr. Benjamin Simon, Miss Elizabeth Stanton, Mr. Pendleton Tompkins, Mr. William Wendel.

KAPPA

University of Kansas

Kappa Chapter fell down on the job last fall and failed to get in a report for the November BIOLOGIST. Upon working up this late report we find that we have considerable news to report and that it will be necessary to leave out some items.

On November 22, 1928, we held initiation for a number of unusually fine "budding" biologists. All initiates have been very faithful and have proven themselves trustworthy since the date of initiation. It is with pride that the following list of names is reported: Anatomy—Delbert O. Haage; Bacteriology—Esther Hulpieu, Paul Kabler, Homer Spencer, Ann E. Suderman, James C. Willey; Biochemistry—Chas. E. McArthur; Entomology—Mrs. Leone Harding, Lawrence Woodruff; Physiology—Leo Gottlieb, A. M. Lands; Psychology—Dr. Harry R. DeSilva (faculty); Zoology—Edith Beach, H. Ernest Crow, Katherine Dolman, Louise Fulton, Jennivieve Herman, Phil

Powers, Marie Scott. On January 10, 1929, James C. Hofmann of the Department of Bacteriology was initiated.

Some of our faculty members have been having some most interesting and profitable experiences. Dr. H. B. Hungerford, state entomologist, and head of the Department of Entomology at the University has just returned from an eight-months visit in Europe. "Doctor Hungerford went to Europe for the purpose of comparing insects in the University collection—accredited a notable one in the middle west—with the type collections in the older museums of Europe. He took with him several thousand specimens of insects from Kansas, the rest of the United States, and some from South America. Comparisons with the specimens in the European museums showed that the identification in many cases had not been correct, but now the Kansas collection corresponds with the names given by earlier European scientists."

Doctor Hungerford spent nearly three months in the National Museum at Paris, and made visits of two weeks or less at the University of Glasgow, Perthshire Museum in Scotland, Cambridge, Oxford, and London, two museums in Berlin, University of Harle, Hamburg, Kiel, Copenhagen, University of Stockholm, University of Upsala, Dresden, Prague, Vienna, Budapest and in Switzerland.

Doctor Hungerford went as a collaborator for the Smithsonian Institution, Washington, and stopped in Washington before returning to Kansas. He also attended the meetings of the American Association for the Advancement of Science in New York." (The above was taken from the Graduate Magazine of the University of Kansas.)

Dr. Phillip A. Readio, of the faculty of the Entomology Department was awarded a National Research Fellowship. He is studying at the University of Minnesota. He is doing some work with Dr. Chapman on the "Ecology of Certain Insects."

Mr. Howard Deay, of the Department of Entomology, left K. U. the first of February to accept the position of professor of entomology at the Indiana State Agriculture College, Purdue, Indiana.

Dr. R. H. Beamer, professor of entomology, and two undergraduates took a six-weeks collecting trip in July and August, 1928. They did some extensive collecting in southern Texas, and Mexico, and returned to Kansas by way of Louisiana and Arkansas.

Dr. A. A. Schaeffer, professor of zoology, spent the earlier part of last summer at Tortugas, and then went to spend the rest of the summer at Cold Spring Harbor. He was working on the "Spiral Movement of Leucocytes".

Dr. Edward H. Taylor, accompanied by Albert Lunceford, Jr. of Ottawa, Kansas spent the entire summer collecting reptiles and amphibians in the southwestern part of the United States. Special effort was made by Doctor Taylor to obtain a large series of the various species and subspecies of *Cnemidophorus*.

dophorus and *Sceloporus* for the purpose of determining intergrading forms. Much of the collection will be available for students in the course in herpetology offered at the University of Kansas this semester.

Miss Mary E. Larson, assistant professor of zoology, is away from the University on a year's leave. She is studying at the University of Upsala, Sweden. All reports are to the effect that she finds Upsala exceedingly interesting.

Professor Wm. J. Baumgartner, of the Zoology Department, is studying this year at the University of Munich, Munich, Germany. He is on a year's leave of absence from the University.

Lennel I. Wright, instructor in the Department of Anatomy, spent the greater portion of last summer studying at the Marine Biological Laboratory at Woods Hole, Mass.

Mr. David Pankratz, instructor in the Department of Anatomy, spent two weeks in June at Woods Hole. From Woods Hole he went to the Wistar Institute at Philadelphia where he spent the remainder of the summer doing research.

C. Ruth Shaw, instructor of zoology, was awarded the Ida H. Hyde Scholarship for the summer of 1928, at Woods Hole, Mass. Her reports are to the effect that the M. B. L. is an inspiration to those aspiring to continue in the field of biology.

Our president, Mr. Urban Eversole, was unable to represent Kappa chapter at the National Convention. However, we were well represented by our last year's President Mr. Geo. T. McNair, instructor of zoology. His report to the Chapter of the convention and the meetings was most interesting.

LESLIE B. SMITH.

MU

University of California

(Received Dec. 11, 1928)

Under the direction of Alden Crafts, graduate student in plant physiology, the University of California Chapter has enjoyed several interesting dinner meetings this fall. Dr. W. W. Robbins of the Department of Botany at Davis, California, talked at one of the meetings on "The Sugar Beet Industry in California". Dr. C. A. Kofoed, of the Department of Zoology, spoke at the September meeting on "The Environment for Research". Laura Lee Smith, graduate student in household science, gave a short talk at the October business meeting on "A Correlation Between the Development of Vitamin A in Plant Tissues and their Carotinoid Content". At the fall initiation banquet held on November 15 twenty-eight active members and two faculty members, Professor J. T. Barrett of plant pathology, and Dr. Agnes F. Morgan of the Department of Household Science were initiated. During

the past year the Department of Household Science has been admitted to share the advantages of Phi Sigma. The graduate members of this department are actively engaged in biological research problems, some of which are the following:

Norma Davis—Basal Metabolism.

Ann Field—Vitamin Content of Fruit Dried in Various Ways.

Gladys Anderson—Vitamin A and Purine Metabolism.

Eva Court—Acid-base Equilibrium.

Alvina Misch—Acid-base Equilibrium.

Edith Lantz—The Effect of Egg Extracts upon Anemia in Rats.

Laura Lee Smith—The Development of Vitamin A and the Carotinoids in Plant Tissues.

At one meeting Dr. G. W. Porter of the Department of Chemistry gave a most interesting lecture on "Some Photo-chemical Reactions".

During the next semester Phi Sigma hopes to sponsor a public lecture along biological lines.

Miss Lillian Hollingshead of the Department of Genetics will represent Mu chapter at the National Convention of Phi Sigma in New York City. At the same time she will give at the Joint Genetics Section of the American Society of Zoologists and Botanical Society of America, the following paper, "A Lethal Factor in *Crepis*, Effective only in an Interspecific Hybrid".

The California Chapter lost one of its outstanding members, William Gray of the Botany Department, who died suddenly last May. Mr. Gray was born in Ireland, came to Canada where he studied at the University of Manitoba finishing at the University of California where he received his A.B. degree in 1924. For several years following he taught botany at the University of California in Los Angeles. He returned to the University of California in 1927 where he worked under Doctor Goodspeed on "Interspecific Hybridization in *Nicotiana*; some cytological and other features of F_1 *glutinosa* and *sylvestris*". He received his M.A. degree in 1928. At the time of his death he was actively engaged in a quantitative study of the effect of radium rays on flowers and fungi and the germination of seeds.

LAURA LEE W. SMITH.

NU

Washington and Jefferson

(Received Nov. 20, 1928)

At our reception in September we initiated seventeen members. Our President, Connell Miller, gave a short history of the Society and of the local Chapter. Doctor Martin and Mr. Deiter, both professors in the Biology Department, gave short talks in which they welcomed the initiates.

At the first business meeting the work for the year was outlined. The new members are expected to prepare a short paper on subjects of their own interest. We hope to have several noted biologists speak to us sometime in the near future. The financial condition of the Chapter was also discussed. Due to the success of our exhibition last year the Society voted to buy with their extra money a collection of Pennsylvania birds for the museum.

Mr. Deiter is preparing a lecture on the subject of "Twinning Invertebrates". In his work for his degree he did some research work in this field. Also, Mr. Porter, who is very much interested in algae, is now doing work on the varying environments and the effects on algae, especially their reproductive phases. We will benefit from his study several months from now.

We have heard from six of our old members who were doing work for the government last year. They reported a very profitable summer.

Doctor Martin, our faculty adviser, spent part of his summer teaching at Kansas State Teachers College. He later traveled in California and Alaska. Professor Deiter was at the University of Chicago for several months doing work in the Department of Physiology and Physiological Chemistry. Several of our members, including Mr. Porter, were at the University of Pittsburgh during the summer taking advanced work.

WILLIAM R. SNOWDEN.

At our initiation in November we added thirteen new members to our Chapter. They are as follows: H. R. Brindle, R. Bushager, F. W. Callahan, H. C. Flickinger, M. Helfrish, W. Humbert, W. Irwin, C. Keim, Y. Logan, McMurray N. Parker, and J. Vaihl.

Doctor Corwin spoke to us at one of our meetings on "The Lives of Louis Pasteur and Lord Lister". Doctor Corwin is very much in demand, and we were very fortunate to have him lecture to us.

Our new members were required to prepare papers on subjects which covered some part of their special fields. Very interesting papers were read dealing with the following subjects: "Corn Borer", "Three-Eyed Fish", "Plant Diseases", "Fun of Being a Scientist", and "Afternoon of a Biologist". Doctor Martin and Professor Deiter, who are doing research work, will be prepared to speak to us later.

Connell Miller represented us at the Convention of Phi Sigma this year at New York. His report was very interesting. Just at present we are preparing for our annual banquet and exhibition.

PI

Emory University

(Received Nov. 20, 1928)

Pi Chapter closed a very successful year last spring with a banquet at the Candler Hotel in Decatur, Ga. At the meeting the group was addressed by Professor P. W. Fattig, curator of the museum of Emory University, on some entomological collections and researches he has been making recently. Election of officers for the new year 1928-29 was also held at this meeting. Officers elected were: Willie B. Redmond, President; Robert H. Bayley, Vice-President; Bascom A. Belcher, Secretary-Treasurer.

Prospects are bright for another good year in Pi Chapter with an enrollment of twenty active and faculty members. The group has begun its regular meetings on the first Saturday of each month and thus far has had three very interesting and enjoyable meetings. At the regular meetings we have a speaker who usually reports on some phase of research he has been carrying on.

Our second meeting was in the form of an outing and field trip sponsored by the Chapter, at Stone Mountain on November 3rd. About fifty biologists were present including some from other schools, especially from Agnes Scott College, our neighboring institution. The group spent most of the afternoon studying the flora and insects found on and around the foot of the mountain. Later in the evening all gathered around a large camp fire to enjoy a wholesome weiner and marshmallow roast. Rain prevented the last part of the program.

At the last meeting of Pi Chapter the report of the Membership Committee was heard and new members were voted on for the first part of the year. Those elected were:

John Venable, C. H. Mitchell, William Mitchell, and Joe McGinty all from the school of medicine, Atlanta, Ga.

Mrs. E. B. Paisley, graduate student in biology and research assistant in the department. She is doing research on the encystment phenonema of *Euglena quartana*, Atlanta, Ga.

Miss Charlotte Emerson, graduate student in biology, student assistant in zoology, and doing research on the habits and food factors of mosquitoes found in this vicinity, Atlanta, Ga.

Mr. Hawey Wells, graduate student in biology and assistant instructor in zoology, Richmond, Ga.

Miss Katherine Roundtree, graduate student assistant in the Biology Department, Emory University, Macon, Ga.

Mr. Jack Lee, student in biology and senior in the School of Liberal Arts of Emory University, Covington, Ga.

Mrs. Helene Norwood Lammers, instructor, Agnes Scott College, Decatur, Ga., and taking graduate work in the Biology Department at Emory.

Miss Myrtie O'Steen, graduate student in biology in the Extension Department, Atlanta, Ga.

Miss Ida Landau, student assistant in bio-chemistry; graduate student in biology and making studies on soil *Amoebae*, Atlanta, Ga.

Miss Lucile Coleman, student in biology and research assistant to head of department, Atlanta, Ga.

We have the pleasure of recognizing one honorary member at this time. Doctor Wycoff, professor of biology at the Georgia School of Technology, Atlanta, Ga.

Considerable research is being carried on by members of Pi Chapter, especially that encouraged by the faculty members who are always an inspiration to the younger members.

Dr. Robt. C. Rhodes, professor of biology, is giving a long untiring study on *Heteronema acus*.

Dr. W. B. Baker, associate professor of biology, is carrying on extensive studies on food factors and their relationship to encystment and division in *Euglena quartana*.

Dr. Homer Blincoe, professor of anatomy in the Emory Medical School, has just published a report of his researches on the distribution of the brachial nerves into the muscles of the forelimb of the rat embryo with respect to the origin of movement of the forelimb.

Mr. W. B. Redmond, instructor in zoology in the Emory Biology Department is making studies on the "Life Cycle of *Pinus taeda*" and also on the "Germ Cell Cycle of *Physaloptera turgida*".

Dr. Mary S. MacDougall, professor of biology at Agnes Scott College, is making studies on *Chilodon* with respect to polyploidism found in this animal.

Mr. Bascom A. Belcher is making a study of "Microspore Formation in *Peltandra virginica* (Arrow Arum)" and also "Morphology and Cytology of *Euglena polymorpha*".

ALUMNI NEWS

The chapter misses very much the leadership of John Turner, who has been instructor in zoology at Emory for the past two years and who now has a teaching fellowship at the University of California and is a candidate for a Ph.D. degree in that institution.

Roberts Venerable Brown received a master's degree here last summer and this year is associate professor of biology in Southwestern University at Georgetown, Texas.

Miss Peggie Brown finished her master's work last spring and is now professor of biology in Flora MacDonald College, Red Springs, N. C. Miss Brown studied at Woods Hole last summer.

Mr. Harwell P. Sturdivant is entering on his second year of graduate work in Columbia University. At the same time he is instructing in comparative anatomy at N. Y. U. Mr. Sturdivant was also a student at Woods Hole last summer.

Mr. W. B. Redmond spent the greater part of the summer at Woods Hole taking courses and collecting research materials. He returns as instructor in the Zoology Department of this school.

Dr. J. B. Mitchell, who received his degree from Chicago last spring, has accepted a position as associate professor of biology at the University of Georgia. He was a recent visitor to Pi Chapter.

Mr. Clinton L. Baker is at Columbia studying after two years of teaching at Milsaps College in Mississippi. Baker also studied at Woods Hole last summer.

Miss Florence Stuck is teaching biology at Columbia College, Columbia, S. C. She is carrying on research in the ecology of certain protozoa.

Miss Lucile Caldwell is instructor in biology at Agnes Scott College, Decatur, Ga.

B. A. BELCHER.

RHO

University of Illinois

(Received Nov. 29, 1928)

At the January meeting Mr. Luce gave a report of the American Association for the Advancement of Science meetings held at Nashville, Tennessee, during the holidays. Following Mr. Luce, Dr. H. K. Chen, a member who recently obtained his Ph.D. degree in zoology, gave a discussion of his thesis.

In February, Rho Chapter held an initiation and gave a banquet for four newly elected members. These were: J. Carroll Bottum, assistant in animal husbandry; Arthur Moinot, assistant in botany; Eva Rwan, assistant in zoology; and Collins Veatch, assistant in agronomy. Doctor William P. Hayes gave the address of the evening, using as his subject "Sorting Ore in the Gold Mine of Research".

A meeting was held in March for the election of officers and the nomination of candidates for membership. The officers chosen for the next year were: President, F. W. Clark; Vice-President, W. H. Micheals; Treasurer, H. J. Bennett; Corresponding Secretary, Collins Veatch; Recording Secretary, S. W. Decker.

In April the Society held an initiation, followed by a banquet for sixteen newly elected members. Dr. Rossleene Arnold Hetler was elected to faculty membership. Dr. Elmer Roberts was elected to honorary membership. Those elected to active membership were: Clarence P. Berg, chemistry; Eleanor H. Dorsett, botany; Olalla E. Glasgow, botany; Willard M. Gersbacker, zoology;

Earl W. Henderson, animal husbandry; Marie D. Jones, botany; R. O. Malcomson, entomology; R. L. Matlock, agronomy; Walter J. Mumm, agronomy; B. B. Palmer, entomology; James S. Potter, horticulture; G. M. Shear, botany; L. H. Townsend, entomology; and Lois Wyatt, physiology.

The following members of Phi Sigma received their master's degree during the past year:

J. C. Bottum, farm organization and management; S. W. Decker, botany; Eleanor H. Dorsett, botany; W. M. Gersbacher, zoology; Olalla E. Glasgow, botany; Marie D. Jones, botany; R. L. Matlock, agronomy; W. J. Mumm, agronomy; B. B. Palmer, entomology; Clara M. Roewe, home economics; J. M. Sanders, zoology; Florence L. Sanford, botany; G. M. Shear, botany.

The following members of Rho Chapter received the degree of doctor of philosophy during the past year:

Hsin-Kuo Chen—The development of the pectoral limb of *Necturus maculosus*.

Eugene Amos Hollowell—Effect of soil and atmospheric moisture on red clover seed production.

Ogle Hesse Sears—Factors contributing to the unproductiveness of certain alkali soils in Illinois.

Earl Gwin Sieveking—The effect of certain cultural conditions upon the chemical composition of different strains of corn.

Floyd Leslie Winter—A statistical study of the Illinois chemical strains of corn.

Wilhelm Gerhard Solheim—Morphological studies of the genus *Fresenius*.

Doctor Winter and Doctor Sears are now in the Agronomy Department here at the University of Illinois. Doctor Hollowell is with the United States Department of Agriculture and is now located in Washington, D. C. Doctor Solheim is teaching botany at the North Dakota Agricultural College. Doctor Sieveking is employed by Funk Brothers Seed Company, at Bloomington, Illinois. Doctor Chen has returned to China to continue his work in zoology.

We are starting the year with thirty-two active and twelve faculty members.

Our first meeting of the year was a picnic, October 12, at Crystal Lake Park. We enjoyed real feasting and fellowship around the camp fire. The cider jug went around and we finished the evening with a sing.

At a meeting of our chapter November thirteenth, a very interesting and instructive talk was given by Dr. H. J. Van Cleave, of the Zoology Department on, "Relative Size". On the eighteenth of December Dr. W. P. Hayes gave a talk on "Insects of wheat and flour", stressing particularly the methods of mill fumigation and insect control. Mr. F. M. Clark, our delegate to the Na-

tional Convention, gave us a very vivid account of his trip to New York at the meeting of our Chapter February fifth.

We are looking forward to some very interesting and stimulating meetings this year.

COLLINS VEATCH.

PHI CHAPTER

University of New Hampshire

(Received Nov. 26, 1928)

Phi Chapter has had many interesting and enjoyable meetings this year. During the spring, the election of officers was held, nine new members were initiated, and there were numerous meetings where discussions were held or papers were given by the members. The officers for this year are: Theodore Karabelas, President; Marjorie West, Vice-President; Ruth Pitcher, Recording Secretary; Leon Glover, Treasurer; Ruth Thompson, Corresponding Secretary; Joseph Houser, Marshal; and John Mara, door-keeper.

On March 14, Phi Chapter held an open meeting as "Pre-Medical Night", for all those interested. Doctor Flanders, the special speaker of the evening, gave an interesting account of his experiences as a country doctor. Professor C. F. Jackson spoke on the function of pre-medical work, and Mr. Barton gave a talk on the requirements of medical schools.

A clam-bake held at Goat Island in the mouth of Great Bay, was part of the social program of the spring term. Even a heavy rain could not dampen the good spirits of the crowd, and everyone enjoyed himself to the utmost.

A few of the papers given last spring included the following subjects: "Diabetes", "Anaesthesia", "The Social Background of Health", "The Inheritance of Mental Diseases", "The Sponges of Wheelwright Pond", "Pollination", and other topics of biological interest. Cavett Prickett gave a talk on histological technique, and by means of a projecting apparatus, used his own slides as illustrations.

Each year at commencement, Phi Chapter offers a prize to the senior who has shown the greatest ability along biological lines during his four years at the University. The prize was awarded this year to Miss Anna Philbrook.

During the summer, many of the members of Phi Chapter studied at the Marine Zoological Laboratory at the Isles of Shoals. Most of the members there were engaged in some special project. All report an interesting and profitable summer, and are most enthusiastic about the laboratory.

A special Phi Sigma week-end gave other members a chance to visit the laboratory and see the work which was being done. A trip around the island under a brilliant display of northern lights, and an early morning fishing trip were all part of a delightful week-end. Among those members who visited the laboratory were: Edythe Tingley, Katherine Flanagan, Carolyn

Dodge, Dr. L. P. Latimer, Oscar Pearson, Nicholas Colovos, Roland Dearborn, Edwin Rasmussen, Leon Glover.

Three members of Pi Gamma, the former zoological fraternity, were on the campus during the summer and were initiated into Phi Sigma. Dr. A. E. Dolloff is research assistant in public health at Yale Medical School.

Oscar Pearson has just received his Ph.D. degree from the University of California. This year he is working as instructor and junior plant breeder in the Experiment Station of that university. William Smith is working for his M.S. degree in horticulture, at the University of New Hampshire.

This fall, a class of eleven initiates were taken on a trip to the White Mountains for pledging. The party, consisting of about thirty members, left Saturday noon, arriving at the Willey Camps in Crawford Notch at about seven o'clock, and spent the evening around the campfire. The next morning two groups started out. One, under Professor G. W. White, climbed the Webster Cliff trail over Mt. Webster; and the other, under Professor C. F. Jackson, went up the Crawford Bridle Path. The two groups met at the Mizpah Shelter on Mt. Clinton, where pledging took place and all came back together by the Crawford Bridle Path in the late afternoon.

At a recent meeting, we received printed programs for this year. It is planned to hold informal meetings for discussions and papers at the various fraternity houses on the campus. Business meetings will be held in administrative buildings.

Besides our initiation, we have had papers given on: "Brain Surgery", "Ether Soluble Material in the Fruit Spur of the Apple", "Origin and Recovery of Petroleum", and several other topics.

Research in Phi Chapter:

Each member is required to present a thesis representing some line of biological research, at sometime during the year. Besides this, many of the members are working on advanced or personal problems.

Donald G. Barton is working on a problem in comparative anatomy of the Chelonia.

Joseph Bourque has a problem in mounting skeletons of fish for museum purposes.

Mr. Walter A. Chipman is engaged in determining the effect of caffeine on the offspring, when administered to the mother. Present reports seem to indicate interesting results.

N. F. Colovos is working on, "The Ether Soluble Material of the Fruit Spur of the Apple". The analysis of the ether soluble material of the fruit spurs was undertaken as a further study of the composition of the fruit spurs.

Leon Glover is working on "The Toxicity of Soap in Insect Sprays".

Theodore Karabelas is engaged in a problem connected with the mounting of a mammalian skeleton for museum purposes.

Dr. L. P. Latimer has several problems on which he is working at the present time. 1. Changes occurring in apples during common and cold storage. Physiological changes, changes in pH, and in the concentration of carbohydrates in the sap, and the respiration of stored fruit are being observed as part of this experiment. 2. Strawberry fertilizer experiment—to determine the effect of inorganic and organic nitrogen fertilizers on growth and yield of strawberries. 3. Pollination. A study of the pollination demands of various species of apples.

Professor P. R. Lowry also has several problems of research. 1. A study of the mosquitoes of New Hampshire with special reference to the salt-marsh mosquito and its control. 2. A study of codling moth control in New Hampshire. Besides these personal problems, he is coöperating in departmental problems on: 1. Life history, habits, natural enemies, etc., of the white pine weevil. 2. The penetration of insecticides.

Edwin Rasmussen of the Horticulture Department is studying the development of fruit buds in the apple, with relation to their time of differentiation.

Frank S. Schlenker is making a study of some of the chemical phases of poultry paralysis. This disease causes much loss among poultry raisers every year. The exact cause of the paralysis is not known, and this thesis aims to work out some of the chemical phases of the trouble.

John F. Sheehan is working on comparative histology of the Mollusca.

Dorothy T. Smith is making a systematic and ecological survey of the sponges of the Isles of Shoals.

Edythe M. Tingley is working on some problems connected with inheritance in *Drosophila*.

This is not a complete list of the research problems of members of Phi Chapter but is, perhaps, representative of some of the work that is being done.

CHI

Montana State College

Following the usual custom of Chi Chapter five humorous papers were presented by candidates at initiation, February 2. The papers presented were: Richardson, Opal—"The Taxonomic Position of Flowers of Sulphur"; Mills, Virginia—"Frozen Sunfish as a Source of Cold Light"; Mabee, William B.—"Milk Snakes and Their Relation to the Dairy Industry"; Gamble, Genevieve—"Windig's Parasites of Hydraulic Rams"; Hinds, Mable—"pH as a Constant or Variable in Ph.D." In these papers scientific truth was not sacrificed for literary quality.

This month Chi Chapter has its second anniversary since its installation by the late Dr. J. E. Kirkwood of the University of Montana.

Mr. F. B. Cotner who has been associate professor in botany and bacteriology at Montana State College is working for his Ph.D., at the University of Michigan; Edith Swingle of the class of '28 has taken his place here for this one year. George Cummins and James Bradbury, both of the class of '27, are working for degrees at Ann Arbor, Michigan. Sara Kendal, '27, has an assistantship and is working for her master's in bacteriology at Ames, Iowa.

FRIDA HENDRICKSON.

PSI CHAPTER

Installation: **University of Washington**

The most recent chapter of Phi Sigma in the Northwest was installed at the University of Washington, Seattle, on April 7, 1928, by Prof. J. E. Kirkwood (Lambda), of the Department of Botany, University of Montana. The installation ceremony was followed by a dinner, after which Professor Kirkwood gave an address on "The Pacific Element in the Rocky Mountain Flora".

In addition to Lambda, represented by Professor Kirkwood, the following chapters were represented at the installation, by members now resident in Seattle: Beta (Michigan), Dr. Melville H. Hatch; Mu (California), Dr. Robert C. Miller; Xi (Nebraska), Miss Katherine Wolfe; Lambda (Montana), Miss Helen Adams.

The charter members of the chapter are thirty-three in number. The initial officers of the chapter were: President, Albert Snoke; Vice-president, Julia Goodsell; Secretary, Elizabeth McKay; Treasurer, Hebbel E. Hoff. They were succeeded at the close of the spring term by the present officers: President, Keith O'Leary; Vice-president, Roy T. Fisk; Secretary, Florence Folda; Treasurer, Anna Church.

Spring and autumn initiations have increased our original membership to sixty-six.

It is the custom of the chapters to meet for dinner once each month. At these meetings papers are presented by members, or a talk is given by a member of the faculty. A short business meeting is also held once a month.

MEETING OF PHI SIGMA AT THE PUGET SOUND BIOLOGICAL STATION

One of the first projects of Psi chapter was the sponsoring of a Phi Sigma dinner at the Puget Sound Biological Station, Friday Harbor, Washington. Twenty-four members from six chapters were registered at the station during the summer, almost all carrying on original research. Registration included the following members of Phi Sigma: Dr. W. A. Kenyon, Zeta; Dr. and Mrs. H. M. Miller, Elsie Mahaffey, Zola Cooper, Iota; Dr. R. C. Miller, Mrs. Robert Palmer, Mu; Willard Gersbacher, Rho; Dr. R. Wolcott, Prof. James McNab,

Xi; Marcia Fouts, Helena Werby, Belle Stevens, Mrs. Lena Hartge, Wilma Warner, Florence Dean, Florence Folda, Lyman Pfifer, Albert Snoke, Wayne Wells, Ernest Angst, Richard Butt, Psi.

It is our hope to continue this annual summer meeting of students enrolled at Friday Harbor.

CANTI MOTION PICTURE OF CELL DIVISION

A showing of the Canti motion pictures of cell division and other cytological phenomena, including the action of radium, with explanations by Dr. R. C. Miller, was presented at an open meeting on Feb. 12, 1929. These remarkable pictures were prepared under the direction of Dr. Reginald Canti of the British Imperial Cancer Institute and Professor Strangeways of Cambridge University. The films depict cells from the rat and the chick grown outside of the body in tissue cultures. The process of cell division is dramatically shown, including the emergence and division of the chromosomes and the formation of the daughter cells. The action of radium emanation upon both normal and malignant cells is well illustrated, as are also amoeboid movement and the behavior of phagocytic cells. The films were shown in December at a general session of the American Association for the Advancement of Science, in New York City and Psi chapter was extremely fortunate in securing the film for showing at this time. The meeting was well attended by members of the University and of the local medical profession.

FLORENCE FOLDA.

OMEGA

University of Oklahoma

Several interesting meetings of Omega Chapter have been held since the last news letter went to press; as well as an initiation service for fourteen new members. Although not yet a year old on this campus, Omega Chapter has thirty-eight first class members. We are fortunate in having on the campus the National President, Dr. Paul B. Sears, as well as Dr. A. I. Ortenburger, the National Secretary-Editor.

Our delegate, Mr. Aaron Sharp brought back an interesting as well as instructive account of the Convention at New York. In addition to attending the meetings of the Convention, Mr. Sharp read a paper on the "Bryophytes of Eastern Oklahoma", before the Sullivant Moss Society.

The local chapter on January 21 sponsored a talk by Dr. F. C. Steward of Leeds University, England. Doctor Steward has been studying at Cornell and stopped here on his way to spend the rest of the year at Berkeley.

On the eighth and ninth of February a "Biological Roundup" is being held on the campus. It was sponsored by the local Chapter and the Biology

Club of the University. Twelve colleges and Universities of Oklahoma and Kansas were represented by their Biology Clubs. The project was under the capable direction of Miss Lois Gould. Dr. W. M. Goldsmith of Southwestern College, Winfield, Kansas; Professor O. C. Schultz, Oklahoma A. and M. College; and Mr. George Phillips, State Forester of Oklahoma, addressed the meetings.

At the last meeting of the Chapter held January 16, Dr. A. S. Foster of the Botany Department talked on bud scales as a part of the program. Doctor Foster, who is new to the department this year, has been in England at Leeds University for the past two years where he studied under Priestley. For the remaining meetings of the year it is planned to have the various graduate students of the Botany and Zoology Departments give talks on their research problems. Several very interesting meetings are anticipated.

PHYLLIS DRAPER.

ALPHA ALPHA

University of Southern California

At the beginning of this school year Alpha Alpha Chapter started its active work as a chapter of Phi Sigma. The first two meetings were taken up with matters of organization for the coming year.

At the December meeting Dr. Chester A. Stock, professor of vertebrate paleontology at the California Institute of Technology, gave a very interesting talk on his recent research work with material from the La Brea Pits.

The January meeting was given over to a report from Miss Higgins, our delegate to the National Convention. We were much interested in this report and now feel as though we really belong to a national organization. After the report a social hour was enjoyed by the members and their guests.

For the February meeting Dr. Myrtle Johnson, coauthor of the interesting book, "Sea Animals of the Pacific Coast", will give a talk on the "Behavior of Fiddler Crabs". We are looking forward to this talk with great interest as over half of our members are interested in marine biology.

We are planning a field trip in the near future to the New Botanical Gardens which are being established near Los Angeles.

ALPHA GAMMA

University of South Dakota

(Received Dec. 4, 1928)

The change from a local Biology Club to a chapter of Phi Sigma has been effected. This transition means not only the attainment of a goal, but also the assumption of greater responsibility and even higher goals.

Dakota Day has become traditional at U. S. D. as Homecoming. The customary parade contained 110 floats. Oswald, the pet alligator in the

Zoology Department, attracted considerable attention as the feature part of the Phi Sigma float.

Professor W. H. Over, curator of the museum, addressed the chapter at the initiation dinner, Nov. 5, on "Qualifications of a Naturalist". Professor Over is nationally known as South Dakota's naturalist.

Norberto Magsumbol has finished his thesis on "Studies on Cell Constancy in *Pinus sylvestris*" and the article has been sent to the editor of the Philippine Journal of Science for publication. Cell constancy in plants is apparently a unique subject. Already considerable work has been done in zoology in the field of cell constancy.

Dr. Edwin P. Churchill, professor of zoology, has been doing field work for the last three summers on a survey of the fish of the lakes in South Dakota. These have been brought to the laboratory of zoology at the University of South Dakota for study. A publication on fishes of South Dakota is forthcoming. This work is being directed by the South Dakota Fish and Game Department. Graduate students are working on various problems connected with this survey.

George Smith is working on his master's thesis, "The Study of the Foods of Certain Minnows of South Dakota" and the specimens used are those collected by Doctor Churchill. The stomachs and intestines are removed for examination of food content. A record is being kept both qualitative and quantitative of the kinds of food found. Some of the most numerous kinds of food are: insect eggs, certain algae, Ostroachoda, Rotatoria, and Diatoms.

Richard Zalesky is working on another phase of the same problem and deals with "The Food of Trout of the Black Hills of South Dakota". Stomach contents of Brook, Rainbow, and Lock Leven trout are being examined. The results of this investigation will be the basis for his master's thesis.

The research work of Bernard Kalayjian centers on the subject of the perfused mammalian heart and the effects of drugs, pressure, and temperature upon it. Standard drugs are being used with variations in dosage. Some special drugs such as Quinidine are to be used and the effect determined on artificially produced auricular fibrillation.

During the past year Eunice Ford made a study of commercial dried buttermilk for the purpose of determining the minimum amount of this material which might be identified in mixed feeds by a microscopic method. Identification of the lactic acid bacteria in the buttermilk was used as the basis of the method. It was found to admit a positive determination of the presence of buttermilk when the proportion was not less than two per cent and, in some cases, when the amount was as low as one-half per cent. Miss Ford is at present engaged in a study of the properties of petroleum lubricating oils, to determine a method for identification of oils from a given source.

The problem of Rollin Conley is concerned with the "Dissociation of

Bacterium coli and the Lytic Action of Bacteriophage thereon''. Using single celled colonies an attempt will be made to show that the so-called rough or R and smooth or S colonies can be reverted one to another or maintained as such by the action of 'phage. It has already been shown that many mutations may exist in filtrate of Bacteriophage obtained from river water and what is an apparent sterile filtrate may show various types of colonies after a period of six or seven days.

The following members of Alpha Gamma chapter attended the A. A. A. S. meetings in New York: Howard C. Abbott, M. Elizabeth Abbott, Eunice Ford.

Iva Larson is research assistant at Kansas State Agricultural College. John Howe is doing graduate work at Johns Hopkins University. Alvin Staack is teaching at Onida, S. Dak.

Installation of ALPHA DELTA Chapter Lawrence College, Appleton, Wisconsin

The granting of a Charter of Phi Sigma Society to the Biology Club of Lawrence College is looked upon as one of the most important and significant recognitions that have come to this institution in recent years. The more important considerations which led to the granting of this chapter were the excellent equipment of apparatus possessed by the Departments of Botany and Zoology; the large and valuable libraries that have been brought together in the departments; the broad and fundamental nature of the courses offered; the records made by graduates who have majored in biology; and the fact that the club has been in continuous and successful operation for a period of seventeen years.

The installation banquet was a most pleasing event in every respect. The toastmaster, Professor Mullenix, was in a happy and facetious mood. The installing officer, Dr. A. M. Keefe, National Vice-President, was charming and gracious. President Wriston, who responded to Doctor Keefe in behalf of the College, in a pleasing address sparkling with wit and humor welcomed the new Society to the Lawrence campus, commenting with special approval upon the fact that Phi Sigma is not merely an honor society, but that it is a working organization.

The interest of the University of Wisconsin chapter was evidenced by the fact that a delegation of four members, headed by Doctor Domogalla, President, came to Appleton to present the greetings of Zeta chapter. It was a matter of keen regret that on account of bad roads this delegation did not succeed in reaching Appleton until nearly the close of the program. In spite of fatigue and hunger, however, Doctor Domogalla in an enthusiastic address presented the greetings and the cordial welcome of the Wisconsin Chapter.

In his installation address Vice-President Keefe made reference to the great multitude of organizations to be found in the modern college, and proceeded to a discussion of the distinctive features of Phi Sigma by virtue of which the organization of this new society is justified. "There is need", said he "in Lawrence and in every other college, for scholastic organizations which will successfully and permanently keep before the eyes of their members the ideals to which their scholastic lives are dedicated.

"Absorption, after the manner of the sponge, is not the ideal of true education. That ideal, rather, is progressive, productive, creative.

"And between these two ideals of education there is a wide gap. The one is personal, the other is social. The one is selfish, the other is generous. The one is easy, the other is difficult. Absorptive study, it is true, may involve a love for knowledge. But productive scholarship, the pushing back of the walls of ignorance, requires for its foundation a galling discipline of body, mind, and spirit; the cultivation of methodical habits of work; and much sacrifice of pleasure, comfort, and freedom.

"And here is where Phi Sigma comes into the campus picture, for Phi Sigma is not merely a social or honor society. Recognizing these features, it seeks to relegate them to their proper place in college life, and cultivate in its members a willingness to undergo the continuous and galling restraints of the scientific method. This it will do in your frequent meetings, in which you will seek to acquaint yourselves with the progress of biological science and to discuss its problems with intelligence.

"No matter what may be the ends to which you devote your lives, Phi Sigma has something to offer you which perhaps no other campus association can afford. You are to look upon your key not as a badge of honor or recognition, but as a reminder of your responsibility as a student, and your obligation, whatever may be your walk in life, to maintain in yourself the curiosity, the inquisitiveness, the tenacity, the open-mindedness and the unselfish disinterestedness of a true man of science."

In response, Mr. Carl Hoffman, President of the newly installed Chapter, spoke in part as follows:

"Doctor Keefe, in behalf of the Biology Club of Lawrence College, now Alpha Delta Chapter of Phi Sigma Society, I want to tell you that we very much appreciate the recognition that has been accorded to us by the National Society. We feel that the aims and ideals of Phi Sigma as set forth in its Constitution are identical with those toward which our Chapter has been working for the seventeen years of its existence, and it was on account of this fact that we made bold to petition for a charter.

"In behalf of the Chapter I want to make this pledge to you, and to all the other chapters of Phi Sigma, that we will sincerely and earnestly devote

ourselves to the quest for Knowledge, and love of Truth, and the cultivation of the Spirit of Science.

“And, Doctor Keefe, we want you to know that we are not unmindful of all that you have done for us in bringing our petition to the favorable attention of the National Society, and we are not unaware that it is largely as a result of the influence you have exercised in our behalf that this recognition has come to us. We shall always think of you with gratitude. We hope we may hear and see you often. We shall look upon you as the godfather and the Father Confessor of our Chapter, and shall claim the privilege now enjoyed by many under your more immediate supervision of addressing you as Father Keefe.”

Installation of ALPHA EPSILON Chapter University of Pittsburgh, Pittsburgh, Pa.

This evening has been a wonderful success for us here at Pittsburgh. It marks the greatest step ever taken by the biological group. This is the first National Biological Society to come on the campus and in this knowledge we know that it surely will hold a big place in our institution.

The installation went off beautifully with Professor R. D. Fox, of the University of Akron at the helm. We were presented with a gavel by Eta Chapter. This gavel has historical significance in that it was made from one of the old research tables of the University of Akron and has had many noteworthy pieces of research accomplished over it.

The installation took place in the Lecture Hall of the Section of Education of the Carnegie Museum. Dr. O. E. Jennings, one of our faculty members and an honorary member of the chapter of Phi Sigma at Washington and Jefferson (Nu) is the curator of this section. After a five course banquet in the Museum Cafeteria, the following speakers were called on: Dr. O. E. Jennings (head of the Botany Department, curator of education and curator of botany at the Carnegie Museum), Dr. J. L. Cartledge (instructor of botany, also Treasurer of the local Chapter), Dr. J. C. Donaldson (professor of anatomy who took the place of Dr. Davenport Hooker, head of the Anatomy Department), Dr. R. T. Hance (head of the Zoology Department), and myself, President of the local Chapter.

Everything went off beautifully and all of the students were impressed with the importance of the task that they have taken on their shoulders. We are all very happy as it is a real victory for the students of this university.

STANLEY T. BROOKS, *Carnegie Museum.*

THE BIOLOGIST

BIOLOGICAL TRAINING AND THE PRINTED PAGE

*By M. C. Merrill, Editorial Chief of Publications,
United States Department of Agriculture.*

Have you ever wondered what in the world the writer of a biological article was driving at? You have probably been attracted to the article by its title. You eagerly pounce upon it for suggestions or information that will help you in your work. But after the first few pages of expectant travel you begin to doubt or wonder or query. Your soul is not being satisfied, and yet duty and conscience force you on to the bitter end. At length you are disgusted and disappointed, mostly with yourself. Your inferiority complex grows. Are you dull or just plain dumb? Perhaps this is an off night or you are tired. Tomorrow you will "get" the author the first time. But will you? That depends not only on you but on the article.

It is possible that the article is all right and is fulfilling its full function—that of providing information for the few whose background enables them to understand it. You know, there is a disturbing number of papers of that type in modern biological literature. And the number seems to be threateningly increasing. But with that class of papers you will probably have no just complaint if they are well written, provided in wading into them you do not get beyond your depth. They will remain as beacon lights for the specialized few.

But it is also possible that the article is very faulty. It may be one that you can consider justly irritating, for it is within your range and yet is all bound up in confusion. The author's thought seems befuddled; there is neither rhyme nor reason to the arrangement; many of his awkward statements say one thing when you are sure he must mean another; and you are positively aghast at the conclusions he derives from his data.

Just as there are teachers of science in our institutions who pooh-pooh the idea of the student of science taking any courses in the method or technic of teaching—on the ground that subject matter is both all important and all inclusive—so there are research workers who regard instruction in the technic of writing as a childish waste of time. And the student who is doing his own thinking as he traverses the established route through college is usually made painfully aware of the result of these viewpoints in the teaching and the scientific literature to which he is exposed.

Of course there are teachers of science who have native teaching ability and teach mighty well; there are likewise research workers whose writings are unusually clear, logical, and effective. If one has the gift of undoubted writing ability bestowed upon him by nature he should be thoroughly grateful. To him

this present paper will not apply, and if he reads it he can do so with self-congratulation.

But how about the great mass of students who are not so endowed? The majority take rank in that comfortable group that is neither brilliant nor stupid. For them the road to unusual accomplishment lies over the stony route of struggle. They must plod and trudge and sweat.

If the student of biology is planning a career in research, or even if his research is to be only a side line, he should keep clearly in mind that the end product is the printed page, not the laboratory notebook. But the printed page imposes definite obligations which should be fairly and fearlessly faced. The principles of composition enter very positively into consideration. Such commonly disdained matters as grammar, spelling, and punctuation require a dusting off and brightening up for service. Oh yes, the writer may neglect these points as being entirely unworthy of the attention of a rising biologist, but he does so at his peril. If there is no merciful editor lying in wait somewhere along the line to knock the rough corners off the contribution, there will be sure to be some merciless reader who will take satanic delight in grinding the paper into meaningless pulp.

Unfortunately, in many of our institutions giving work in biology, and high-class work too, not enough emphasis is placed upon the end-product printed-page aspect of the student's scientific training. Courses in English, language, composition, and analysis of technical writing are under-stressed or not fully appreciated. It is assumed that if the student is deficient along these lines he will brush up on them independently, particularly when he gets into the graduate school or when he is ready to present his results in printed form. But the result of such expectation is likely to be disappointing. Postponement or neglect of adequate training in writing too often occurs. And the discriminating scientific readers recognize the deficiency as soon as the printed page appears. Just as experimental work in agriculture by those lacking thorough training in the fundamental sciences is often characterized by inadequacies, so the writing of a biologist without appreciation of the art of writing carries the imprint of disappointing deficiency.

In this competitive age, however, the law of supply and demand is operating toward higher standards in technical writing. Editors of scientific publications have come on the stage, scientific journals are getting more discriminating regarding the character of the material accepted, and readers of experience in science are demanding greater care in the preparation of manuscripts. The young biologist who has a laudable ambition to make use of the printed page would therefore do well to scrutinize his ability and preparation for writing.

HOFF AND WEBBER

The first of their kind! Phi Sigma needs more Hoffs and Webbers.

Mr. Hebbel E. Hoff and Mr. Ebbe C. Hoff are charter members of Psi Chapter and are now at Exeter College, Oxford, England. They retain, at a considerable distance, a keen interest in Phi Sigma which other members nearer their old chapter might well develop. A reproduction of Hoff's check for a three years subscription to the *Biologist* is shown on this page.

We need more Hoffs!



Mr. George F. Webber a member of Zeta Chapter now at the Agricultural Experiment Station, Gainesville, Florida, is as unique as Mr. Hoff in that his is our first life subscription.

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We need more Webbers!

Report of the National Treasurer

July 1, 1928 to January 1, 1929

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Expenditures	206.24
Balance on hand	846.42

CONVENTION FUND

Receipts	\$2544.18
Expenditures	2544.18
Balance on hand	0000.00

BIOLOGIST FUND

Receipts	\$ 677.74
Expenditures	363.33
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Receipts	\$ 779.33
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